Table 7. Revised **Ammonia Calculations***

Winter: Using **Old** EPA Chronic AWQC of **2.7 ppm NH3** @ pH 7, temp.10C

	Conc. (ppm)	Flow (mgd)	Mass (lb/d)
Natural Background NPS	0.02	18.5	3
Berwick, ME	16	1.1	147
Somersworth, NH	16	2.4	321
Reserve (below Ber. & Som.)			24
Total (below Ber. & Som.)	2.7	22	495

* Note: The purpose of the winter table is to calculate loads and concentration limits for Berwick and Somersworth using the old EPA chronic toxicity criteria.

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Calculations used to create Winter Ammonia Limit Tables:

1. **Set total concentration @ chronic AWQC**.

Ex. Old EPA criteria = 2.7 mg/l as NH3

2. **Calculate total load**: AWQC (mg/l) x total low flow (mgd) x 8.34 = mass (lb/d)
(The actual revised TMDL for the whole non-attainment river segment is higher, including dischargers from Rollinsford and S. Berwick and their reserve capacity contributions. Focusing on just these dischargers is appropriate for ammonia analyses due to degradation of non-conservative substance.)

Ex. 2.7 mg/l x 22 mgd x 8.34 = 495 lb/d load for this sub-segment of river.

3. **Calculate reserve capacity**:*
5% Reserve = 0.05 x (total load - background)

Ex. 5% Reserve = 0.05 (495 - 3) = 24.6 = 24 lbs/day (rounding error, but it won't add up right if 25 lbs/day is used, unless loads for point sources are revised.)

4. **Calculate discharger concentration limit** (with 5% reserve split out):
Basic formula: [0.95((AWQC (mg/l) x total flow) - (background conc. x backgr. flow))] /(Ber. flow + Som. flow) = conc. (mg/l)

Ex. [0.95 ((2.7 mg/l x 22 mgd) - (0.02 x 18.5))] / (1.1+2.4) mgd = 16.02 mg/l = 16 mg/l

5. **Calculate individual discharger mass limits** using concentration limit:
Conc limit (mg/l) x flow (mgd) x 8.34 = Mass (lb/d)

Ex. Mass (lb/d) Berwick = 16.02 x 1.1 mgd x 8.34 = 146.78 = 147 lb/d
Mass (lb/d) Sommersworth = 16.02 x 2.4 mgd x 8.34 = 320.65 = 321 lb/d

* Note: NH has a requirement to provide for 10% reserve capacity when calculating permit limits. Actual permit limits may be lower.